KNOWLEDGE CENTRE FOR AGRICULTURE

INTRODUCTION OF MANDATORY ELECTRONIC IDENTIFICATION OF CATTLE IN DENMARK

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LIVESTOCK REGISTRATION AND MILK RECORDING

Short history background
Preparation process
Devices
Why introduce EID
Cost benefit estimation
Implementation scenarios
Chosen implementation method

DANISH HISTORY

1895: Worlds first regular milk recording scheme started in Denmark

1920: Uniform national tagging system: ear notch, mothers number

1982: New identification system introduced by Danish Cattle Federation

- Unique farm codes (premises code)
- Unique lifetime animal identification codes
  - Combination of farm of origin code (6 digits) and serial animal number (5 digits)
  - Transformation of old identity to new unique identity
- Mandatory for recorded dairy and beef herds (herd book)
- One metal ear tag
  - in combination with ear notches, animals own number

1982: Average herd size in milk recording: 40 cows

DANISH HISTORY

1984: New cattle database utilising the new ID codes

1991: Plastic ear tags introduced

1995: Danish Cattle Federation asks for mandatory identification of all cattle
- Eradication programmes for IBR and BVD

1997: EU legislation on identification and traceability
- The system was already able to meet the EU requirements
- 70 % of all cattle already voluntarily registered (milk recording, beef recording, herdbook)
- Existing ID system adopted by Danish Veterinary Services

1998: Mandatory registration of all cattle completed by March

1998: Average herd size in milk recording: 65 cows

PREPARATION PROCESS

Mid 1990's: Abattoirs discussing bar coding of ear tags
- DCF in opposition
- Readability of bar codes on aged and/or dirty tags
- Better to wait for electronic identification

Constantly following ICAR and ISO groups on animal identification

2000: Studies in bigger herds in Scotland and England

2001 - 2003: Field test in eight herds
- Different herd type types: Dairy or intensive beef production (young bulls)
- Herd management
- Identification entering the abattoir
- Conclusion: EID is an interesting option for Danish cattle industry

2004: Electronic ear tags officially approved by Danish Veterinary Services for voluntary use

PREPARING FOR EID

2006: DCF report discussing technical aspects and implementation of EID

2007: Danish Cattle Federation asked for national legislation on mandatory electronic identification of all cattle

2008: DCF and authorities test tags and readers

- 6 approved tags for cattle, sheep and goats
- Readers chosen from invited manufacturers
- 3 handheld readers and 2 panel readers
- Reading distance in laboratory
- Field in spot check conditions

2009: DCF report reviewed adding also economical aspects

2009: Ministry report on reducing administrative burdens on farmers included introduction of EID for cattle

2010: Electronic tagging of cattle mandatory as of 1. June 2010

June 2010 the average herd size in milk recording was 140 cows

EID DEVICES

Voluntary use:

- Stand alone systems: OK if they work where installed
- Standards applied: Manufacturers decision
- Minimum performance criteria is a matter between user and manufacturer

Mandatory use:

- Universal systems: Most work everywhere
- Must work also when animals move
- Standards applied: Authority decision
- Minimum performance criteria is a matter between authority and manufacturer

Choice:

- Based on experience from the ICAR and ISO work
- Based on own tests and international experience
- Based on EU regulations for sheep and goats (expecting same main standards to be used for other species such as horses and cattle)
- ISO 11784 and 11785 compliant ear tags (low frequency)
- FDX-B and HDX

READ DISTANCE

Important factors:

- Field strength created by reader
- Field strength needed to activate transponder
- Power of response from transponder
- Sensibility of reader antenna

Depending on both transponder and reader

- No fixed read distance can be determined for a device
- Performance expressed in electrical units

No performance requirements set for readers:

- A matter between user and reader manufacturer
  - Choice among approved eartags (and EID technology) lies with the farmer
  - Animals move between farms
  - Change of tag supplier

PERFORMANCE OF TRANSPONDER

Transponders must be performance tested:

- ISO 24631-1 test is conformance of transponders
- ISO 24631-3 test is performance of transponders
- Indicates relative read distance ranges
- Minimum activation field strength and modulation amplitude
  - Low minimum activation field strength
  - High modulation amplitude

Minimum activation field strength:

- EU, sheep and goats: < or = 1,2 A/m
- Canada, Cattle: < or = 1,0 A/m
- Ear tags for cattle in DK all under 0,6 A/m

Modulation amplitude

- EU, sheep and goats: = or > 10 mV at field strength 1,2 A/m
- Ear tags for cattle in DK all > 10 mV at field strength 1,0 A/m

HDX of FDX-B

HDX versus FDX-B:

- Provided the same performance test results from ISO 24631-3 we expect same performance level
- More variation among FDX-B transponders
- Require copy of ICAR performance test letter or test report

Reader issues:

- Some readers read only HDX or FDX-B
- Some readers read one technology better than the other
- Should be able to read both HDX and FDX-B with same performance
- Always require ISO reader

Handheld readers and readers installed in barn equipment

WHY INTRODUCE EID?

Easier everyday herd management
- Automatic identification at key points
- Feeding, milking, sorting, weighing, moving

Improve data quality in registration
- Safe data transfer
- Avoid reading errors
- Avoid writing errors

Improve food safety
- Better traceability through improved data quality

Improve farm economy
- Time savings:
  - Owners handling of animals
  - Service providers handling of animals
  - Less data errors to be corrected in all applications

Estimate cost benefit

ESTIMATED BENEFITS

Better and more effective herd management and implementation of new technique
13 € per cow and year 520.000 cows: **Total 6,7 million €**

Easier identification and registration in AI-service
0,25 € per first service: **Total 173.000 €**

Easier identification and registration in veterinary service
1.33 € per visit: **Total 800.000 €**

Easier identification and registration in milk recording
40 € per visit: **Total 2,0 million €**

Easier identification and registration in hoof trimming
0,40 € per trimming: **Total 240.000 €**

Easier identification and registration in transporting
0,40 € per moved animal: **Total 350.000 €**

ESTIMATED BENEFITS

Continued…

Easier identification and registration in slaughterhouse 1,33 € per slaughtered animal:	**Total**	**650.000 €**
Easier identification and registration in rendering plant 0,40 € per rendered animal:	**Total**	**40.000 €**
Easier identification and registration in markets, shows, etc. 0,80 € per animal:	**Total**	**80.000 €**
Easier identification at authority on farm inspections One working hour per inspection:	**Total**	**67.000 €**
Total annual savings:		**11,1 million €**

ESTIMATED COSTS

Extra cost for EID tags: 650.000 tags, 1,6 € per tag	**1,0 million €**
Readers etc. for service providers etc:	**670.000 €**
Total annual extra costs:	**1,7 million €**
Total annual benefit: 11,1 – 1,7 =	**9,4 million €**

Cost for on farm readers not included:

- Farmers decide whether to invest or not
- Depending on farmers own benefit
  - Herd size
  - Production type
  - Labour economy

CONCLUSIONS

Benefits for authorities alone do not cover the extra cost

Off farm benefits alone (1,2 mill €) do not cover the extra cost

Benefits for service providers (4,3 mill €) are more than double of the extra cost

More than 50 percent of benefits are from on farm applications

- Even with farmers time savings under 30 minutes per cow and year
- Farmers own decision when to invest

When benefits from service providers cover more than the extra cost

- All farmers benefit from mandatory electronic identification
- Provided all benefits can be harvested

Implementation scenarios important

VOLUNTARY USE OF EID

Only farmers seeing personal benefits start using EID.

Service providers and authority inspection bodies reluctant to invest in reader equipment and automatic data capture.

Risks:

- On farm stand alone systems
- Transponders may not follow internationally agreed standards
- ID-codes may not be unique outside the specific farm where applied

National programme necessary

- Define standards
- Approve transponders
- Database on tags issued with country code

Progress too slow. Smaller herds may choose not to use EID

10–15 percent of tags sold in recent years were electronic tags

ALL ANIMALS EID TAGGED AFTER FIXED DATE

Provides gradual implementation

The cost of EID tagging will from the start be at the same level as normal future operating cost

Service providers etc. can incorporate the benefits after a few years

Farmers and service providers will gradually learn the benefits

Improve the interest of voluntary EID tagging of animals born before the start date.

ALL ANIMALS EID TAGGED AFTER FIXED DATA

15 months later:
- ❖ Bulls for slaughter will wear EID
- ❖ Abattoirs will be interested

15 – 18 months later:
- ❖ Heifers for AI-service will wear EID
- ❖ AI service will be interested

27 months later:
- ❖ First calvers in dairy herds will wear EID
- ❖ Veterinarians will be interested

36 months later:
approx. 15 percent of the cattle population still not EID tagged

48 months later:
approx. 10 percent of the cattle population still not EID tagged

RETAG WHOLE POPULATION WITHIN SHORT PERIOD

Big sudden cost

Much extra work for a short period

Benefits not yet evident in practice

Negative moods

After few months everybody

- farmer
- service provider
- authority etc.

will be able to harvest all benefits from EID

CHOSEN IMPLEMENTATION METHOD

Mandatory EID tagging after 31. May 2010

- All herds
- All calves born
- All animals imported

Why this method

- No extra work
- Costs start at expected future level
- Benefits harvested by service providers higher than total annual costs
  - Also farmers not using EID technology themselves will benefit
  - So they should also contribute

Electronic tag in animals left ear - Normal plastic tag in right ear

March – May 2010 all new numbers delivered with EID

May 2010 possibility to order EID tag to replace issued non EID tags

- Avoid “holes” in animal number sequence

Thank you for attention